

REMARKS/ARGUMENT

By this Amendment, claims 1-9 remain pending in this Application. Claim 1 has been amended. The amendment to claim 1 is not made for any statutory purposes. No new matter is added. Applicant reserves the right to pursue the original claims in this Application and in others. Applicant respectfully requests reconsideration in view of the above amendments and the following remarks.

In numbered paragraph 2 of the Office Action, claims 1, 4, 6 and 8 are rejected under 35 U.S.C. § 102(e) as being anticipated by Craven et al. (U.S. Patent No. 5,815,580).

Among the limitations of independent claim 1 which are neither taught or suggested in the cited prior art are a loud speaker unit comprising:

“a processor for *comparing* in real time a *direct* output signal from the microphone with an output signal from a sound source with reference to a frequency characteristic and an echo characteristic of the sound regenerated from the loudspeaker, or a reverberation characteristic of the sound, including the delay time for the echo characteristic or the reverberation characteristic, and correcting a signal from the sound source using the difference in output signal between the microphone and the sound source by reference to the frequency characteristic and the echo characteristic or the reverberation characteristic.” [Emphasis added.]

The invention of claim 1 accordingly provides a loud speaker unit wherein a comparison of the output microphone and sound source signals are utilized such that desirable acoustic effects, such as an echo or reverberations, can be controllably modified every time the claimed loud speaker unit is placed in a new environment. Therefore, as opposed to prior art systems, the inventive loud speaker unit is an adaptive system that controls the above mentioned acoustic effects unique to any given environment.

Accordingly, a portion of the output signal of the sound source is stored and then compared to a direct regenerative feedback signal corresponding to the stored portion. As a result of the comparison, the output signal of the sound source can be modified by either canceling out a difference to eliminate acoustic effects, or an echo and further reverberations can be generated in accordance with the users requirements.

In the “Response to Arguments” section of the Office Action, the Examiner indicates that the filter 5 of Craven can be coupled with a digital processor, therefore it is “inherent that a comparison of some sort” is performed by the filter. Applicant respectfully disagrees.

As previously discussed in the amendment dated August 22, 2002, Craven discloses a coefficient calculator 6 which receives a signal from the microphone 7 to calculate some undisclosed algorithmic coefficient for the filter 5 and then supplies the coefficient to the filter 5. Hence, filter 5 merely filters the input sound source prior to amplification by the loud speaker. There is no teaching or suggestion in Craven that filter 5 does anything more than passively filter unwanted noise based upon a received coefficient from the coefficient calculator 6. Whether the filter is a digital unit or an analog device, the only thing that filter 5 of Craven does is simply permit or not permit certain predetermined frequencies from passing or not passing through it. In other words, the filter 5 of Craven does not in any way compare in “real time and output signal from the microphone with a direct output signal from a sound source” as explicitly recited in claim 1.

Furthermore, filter 5 of Craven does not compare in real time a direct output signal from the microphone with an output signal from a sound source. For example, as shown in Figure 2 of Craven, an output signal from a microphone 7 is indirectly introduced to the filter 5. In particular, the output from microphone 7 is introduced to a coefficient calculator 6 which calculates the coefficient for the filter 5 and then supplies it

to the filter 5. In this way, in Craven, filtered audio reproduction is enabled which compensates for amplitude and phase changes utilizing only the information received from the calculator 6. This is quite different from the present inventive loud speaker unit wherein a direct output signal from the microphone 6 and an output signal from a sound source 2 are both introduced to a processor 3 for comparison.

In view of Craven's failure to teach each and every feature of Applicant's invention as recited in claim 1 as described above, Craven cannot anticipate the claimed invention. Claims 4, 6 and 8 depend from claim 1 and should be allowable along with claim 1 for at least the reasons as described above and for their own unique combination of features which are neither taught or suggested by the cited prior art. Accordingly, Applicant respectfully submits that the rejection is overcome and respectfully requests the Examiner for withdrawal of the same.

In numbered paragraph 4 of the Office Action, claims 2, 3, 5, 7 and 9 are rejected under 35 U.S.C. § 103(a) as being obvious over Craven in view of Yashima et al. (U.S. Patent No. 5,953,431). Craven is deficient as described above. Yashima is cited for a different feature and does not cure the deficiencies of Craven. Accordingly, even if the teachings of Craven were to be combined with that of Yashima, the resultant combination does not teach or even suggest the present invention as recited in claims 2, 3, 5, 7 and 9. Thus, the claimed invention cannot be rendered obvious by a combination of Craven and Yashima. Accordingly, Applicant respectfully submits that the rejection is overcome and respectfully requests the Examiner for withdrawal of the same.

In view of the foregoing, Applicant respectfully submits that all of the currently pending claims in this application are in immediate condition for allowance. Accordingly, Applicant respectfully requests the Examiner to allow the claims and to pass this Application to issue.

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Respectfully submitted,

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APPENDIX B
Version With Markings To Show Changes Made
37 CFR 1.121(b)(1)(iii) AND (c)(1)(ii)

1. (Twice Amended) A loudspeaker unit for a sound source, the loudspeaker unit being adaptable to changing environments, comprising:
- loudspeaker;
 - a microphone for picking up sound regenerated from the loudspeaker;
 - a processor for comparing in real time [an] a direct output signal from the microphone with an output signal from a sound source with reference to a frequency characteristic and an echo characteristic of the sound regenerated from the loudspeaker, or a reverberation characteristic of the sound, including the delay time for the echo characteristic or the reverberation characteristic, and correcting a signal from the sound source using the difference in output signal between the microphone and the sound source by reference to the frequency characteristic and the echo characteristic or the reverberation characteristic; and
 - an amplifier for amplifying the output of the processor.